

U.S. Serial No. 10/089,311
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AMENDMENTS TO THE CLAIMS

1. (currently amended) A fuel oil composition having improved cold-flow properties, said composition comprising a cold flow additive and the following components from various pipestills of a petroleum crude refinery process:

- a. a relatively heavy fraction from a catalytically cracked heavy gasoil in turn derived from an atmospheric or a vacuum pipestill, said fraction having a boiling range of 170 to 380°C in an amount of 3 to 20% by weight and
- b. a gasoil product from an atmospheric pipestill, said product having a boiling range of 225 to 335°C in an amount of 30-50% by weight,

characterized in that components (a) and/or (b) in said composition is at least partially replaced by at least one relatively light naphtha fraction (c) from an atmospheric or a vacuum pipestill, said light fraction (c) having a boiling range of 130 to 235°C and being present in an amount of 3 to 20% by weight, all weights being based on the total weight of the fuel oil composition.

2. (currently amended) A The composition according to Claim 1 wherein component (a) has a boiling point in the range from 184 to 376°C.

3. (currently amended) A The composition according to Claim 1 or 2 wherein component (a) is present in the composition in an amount ranging from about 5-18 % by weight of the total fuel oil composition.

4. (currently amended) A The composition according to ~~any one of the preceding Claims~~ Claim 1 or 2 wherein component (b) has a boiling point in the range from about 244 to 330°C.

5. (currently amended) A The composition according to ~~any one of the preceding Claims~~ Claim 1 or 2 wherein component (b) is present in the composition in an amount ranging from about 35-45 % by weight of the total fuel oil composition.

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6. (currently amended) A The composition according to ~~any one of the preceding~~
~~Claims Claim 1 or 2~~ wherein the light naphtha fraction (c) has a boiling point in the
 range from 136 to 231°C.

7. (currently amended) A The composition according to ~~any one of the preceding~~
~~Claims Claim 1 or 2~~ wherein the light naphtha fraction (c) is present in the
 composition in an amount from about 5-15% by weight of the total composition.

8. (currently amended) A The composition according to ~~any one of the preceding~~
~~Claims Claim 1 or 2~~ wherein the light naphtha fraction has an aromatics content in the
 range from about 60-75% by weight.

9. (currently amended) A The composition according to ~~any one of the preceding~~
~~Claims Claim 1 or 2~~ wherein the fuel oil composition contains in addition one or more
 distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200
 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range
 from about 160 to 380°C and is present in an amount ranging from about 5 to
 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range
 from about 230 to 350°C and is present in an amount ranging from about 15 to
 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range
 from about 210 to 420°C and is present in an amount ranging from about 3 to 8%
 by weight,

all weights being based on the total weight of the fuel oil composition.

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10. (currently amended) ~~A~~ The composition according to ~~any one of the preceding Claims Claim 1 or 2~~ wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

11. (currently amended) ~~A~~ The composition according to ~~any one of the preceding Claims Claim 1 or 2~~ wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

12. (currently amended) ~~A~~ The composition according to ~~any one of the preceding Claims Claim 1 or 2~~ wherein the cold-flow additive is an ethylene vinyl acetate copolymer.

13. (currently amended) A method of improving cold flow properties of a fuel oil composition comprising a cold flow additive and the following components from various pipestill of a petroleum crude refinery process:

- a. a ~~relatively~~ heavy fraction from a catalytically cracked heavy gasoil in turn derived from an atmospheric or a vacuum pipestill, said fraction having a boiling range of 180 to 380°C in an amount of 3 to 20% by weight and

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b. a gasoil product from an atmospheric pipestill, said product having a boiling range of 240 to 335°C in an amount of 30-50% by weight,

said method comprising replacing at least partially components (a) and/or (b) in said composition by at least one ~~relatively~~ light naphtha fraction (c) from an atmospheric or a vacuum pipestill, said light fraction (c) having a boiling range of 130 to 235°C and being present in an amount of 3 to 20% by weight, all weights being based on the total weight of the fuel oil composition.

14. (new) The composition according to Claim 3 wherein component (b) has a boiling point in the range from about 244 to 300°C.

15. (new) The composition according to Claim 3 wherein component (b) is present in the composition in an amount ranging from about 35-45% by weight of the total fuel oil composition.

16. (new) The composition according to Claim 4 wherein component (b) is present in the composition in an amount ranging from about 35-45% by weight of the total fuel oil composition.

17. (new) The composition according to Claim 3 wherein the light naphtha fraction (c) has a boiling point in the range from 136-231°C.

18. (new) The composition according to Claim 4 wherein the light naphtha fraction (c) has a boiling point in the range from 136-231°C.

19. (new) The composition according to Claim 5 wherein the light naphtha fraction (c) has a boiling point in the range from 136-231°C.

20. (new) The composition according to Claim 3 wherein the light naphtha fraction (c) is present in the composition in an amount from about 5-15% by weight of the total composition.

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21. (new) The composition according to Claim 4 wherein the light naphtha fraction (c) is present in the composition in an amount from about 5-15% by weight of the total composition.
22. (new) The composition according to Claim 5 wherein the light naphtha fraction (c) is present in the composition in an amount from about 5-15% by weight of the total composition.
23. (new) The composition according to Claim 6 wherein the light naphtha fraction (c) is present in the composition in an amount from about 5-15% by weight of the total composition.
24. (new) The composition according to Claim 3 wherein the light naphtha fraction has an aromatics content in the range from about 60-75% by weight.
25. (new) The composition according to Claim 4 wherein the light naphtha fraction has an aromatics content in the range from about 60-75% by weight.
26. (new) The composition according to Claim 5 wherein the light naphtha fraction has an aromatics content in the range from about 60-75% by weight.
27. (new) The composition according to Claim 6 wherein the light naphtha fraction has an aromatics content in the range from about 60-75% by weight.
28. (new) The composition according to Claim 7 wherein the light naphtha fraction has an aromatics content in the range from about 60-75% by weight.
29. (new) The composition according to Claim 3 wherein the fuel oil composition contains in addition one or more distillate fractions selected from
- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;

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- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

30. (new) The composition according to Claim 4 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

31. (new) The composition according to Claim 5 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

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- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

32. (new) The composition according to Claim 6 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

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33. (new) The composition according to Claim 7 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

34. (new) The composition according to Claim 8 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 200 to 400°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 160 to 380°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 230 to 350°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 210 to 420°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

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35. (new) The composition according to Claim 3 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

36. (new) The composition according to Claim 4 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

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all weights being based on the total weight of the fuel oil composition.

37. (new) The composition according to Claim 5 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

38. (new) The composition according to Claim 6 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
- (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and

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- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,
 all weights being based on the total weight of the fuel oil composition.

39. (new) The composition according to Claim 7 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
 (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;
 (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
 (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

40. (new) The composition according to Claim 8 wherein the fuel oil composition contains in addition one or more distillate fractions selected from

- (d) a fraction from a vacuum pipestill has a boiling point in the range from about 240 to 365°C and is present in an amount ranging from about 3-7% by weight;
 (e) a fraction from an atmospheric pipestill which has a boiling point in the range from about 183 to 331°C and is present in an amount ranging from about 5 to 15% by weight;

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- (f) a fraction from an atmospheric pipestill which has a boiling point in the range from about 231 to 344°C and is present in an amount ranging from about 15 to 30% by weight; and
- (g) a fraction from an atmospheric pipestill which has a boiling point in the range from about 216 to 395°C and is present in an amount ranging from about 3 to 8% by weight,

all weights being based on the total weight of the fuel oil composition.

41. (new) The composition according to Claim 3 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

42. (new) The composition according to Claim 4 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

43. (new) The composition according to Claim 5 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

44. (new) The composition according to Claim 6 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

45. (new) The composition according to Claim 7 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

46. (new) The composition according to Claim 8 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.

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47. (new) The composition according to Claim 9 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.
48. (new) The composition according to Claim 10 wherein the cold flow additive is present in said composition in an amount from 0.001 to 2.0% by weight of the total fuel oil composition.
49. (new) The composition according to Claim 3 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
50. (new) The composition according to Claim 4 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
51. (new) The composition according to Claim 5 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
52. (new) The composition according to Claim 6 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
53. (new) The composition according to Claim 7 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
54. (new) The composition according to Claim 8 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
55. (new) The composition according to Claim 9 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.
56. (new) The composition according to Claim 10 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.

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57. (new) The composition according to Claim 11 wherein the cold-flow additive is an ethylene vinyl acetate copolymer.